

METHOD AND APPARATUS FOR PERFORMING LOGICAL  
TRANSFORMATIONS FOR GLOBAL ROUTING

ABSTRACT

The present invention provides a new approach and algorithm to optimize various design parameters in global routing. According to an exemplary aspect of the present invention, marked trees are first preprocessed. For every vertex incident to leaves, one may go through the list of its leaves, and if two leaves have the same mark one may leave only one of them. After that whether homeomorphism exists may be determined. The reason behind selecting such homeomorphic pairs is as follows: adding or removing a vertex of degree 2 as well as adding or removing a new leaf (variable) does not significantly modify routing (in this case all routing transformations are in essence splitting and merging routing trees). After the selection of applicable transformations, one may apply them to optimize design parameters. This may be achieved by assigning the same coordinates to nodes of degree  $\neq 2$  of homeomorphic trees, which means that one may assign the coordinates of corresponding nodes to “essential” nodes and then insert or remove nodes of degree 2.